

## **WHAT IS CLAIMED IS:**

What is claimed is:

1. An adaptive method for predistorting a signal to be transmitted, supplied by a signal source to an input of a power amplifier having an output for delivering an amplified output signal, said method comprising the steps of:

predistorting the signal to be transmitted by means of predistortion amplitude and phase look-up tables interposed between the signal source and the input of the power amplifier;

producing, via a first digital receiver, a first feedback signal in response to the predistorted signal;

producing, via a second digital receiver, a second feedback signal in response to the amplified output signal from the power amplifier;

modeling the power amplifier in response to the first and second feedback signals; and

updating the predistortion amplitude and phase look-up table means in response to said modeling of the power amplifier.

2. An adaptive method as recited in claim 1, wherein said first feedback signal includes the complex envelope of the predistorting signal.

3. An adaptive method as recited in claim 2, wherein said second feedback signal includes the complex envelope of the amplified output signal.

4. An adaptive method as recited in claim 3, wherein said modeling step includes the discrimination of the complex envelope of the first feedback signal referenced to the complex envelope of the second feedback

signal to yield a predistortion function correlated to the behaviour of the power amplifier.

5. An adaptative method as recited in claim 4, wherein said modeling step is done in real time.

6. An adaptative method as recited in claim 1, wherein said updating step is done when an adjacent channel power ratio (ACPR) measurement sub-step indicates that the predistorting step is not adequate to meet predetermined ACPR standards.

7. An adaptative method as recited in claim 6, wherein said ACPR measurement sub-step is done via a digital receiver that includes a first channel tuned to the mean frequency and a second channel that is tuned to a predetermined offset frequency, said ACPR measurement sub-step includes comparing the average power at the means frequency and at the predetermined offset frequency.

8. An adaptive device for predistorting a signal to be transmitted, supplied by a signal source to an input of a power amplifier having an output for delivering an amplified output signal, said adaptive device comprising:

a complex gain adjuster interposed between the signal source and the input of the power amplifier;

distorting generator including predistortion amplitude and phase look-up table; said distorting generator being so configured as to control said complex gain adjuster to predistort the signal to be transmitted in amplitude and in phase;

a first digital receiver producing a first feedback signal in response to the predistorted signal from said complex gain adjuster;

a second digital receiver producing a second feedback signal in response to the amplified output signal from the power amplifier;

a control module receiving said first and second feedback signals from said first and second digital receivers; said control module being so configured as to model the power amplifier in response to the first and second feedback signals and to update said amplitude and phase look-up table of said distortion generator in response to said modeling of the power amplifier.

9. An adaptative device as recited in claim 8, wherein said look-up tables of said dirtorting generator are indexed by an envelope detector that detects the envelope of the signal to be transmitted before predistortion.

10. An adaptative device as recited in claim 9, wherein said envelope detector indexes the distorting generator via an analog to digital converter.

11. An adaptative device as recited in claim 8, wherein said look-up tables of said dirtorting generator are indexed by the data from a third digital receiver that down-converts the signal to be transmitted to baseband.

12. An adaptative device as recited in claim 11, wherein the data from said third digital receiver is supplied to said control module that indexes said distorting generator accordingly.

13. An adaptative device as recited in claim 8, wherein said control module is so configured as to updatesaid amplitude and phase look-up tables when an adjacent channel power ratio (ACPR) measurement indicates that the predistortion made by said predistorting generator is not adequate to meet predetermined ACPR standards.

14. An adaptative device as recited in claim 13, wherein said ACPR measurement is done via said second digital receiver that includes a first

channel tuned to a mean frequency and a second channel that is tuned to a predetermined offset frequency, said ACPR measurement including comparing the average power at the means frequency and at the predetermined offset frequency

15. An adaptative device as recited in claim 8, wherein said control module is also so configured as to insert an adequate delay between the first feedback signal and the second feedback signal.

16. A transmitter system for amplifying and up-converting a baseband signal from a signal source; said transmitter system comprising:

a power amplifier having a signal input and an amplified signal output;

a complex gain adjuster interposed between the signal source and said signal input;

distorting generator including predistortion amplitude and phase look-up table; said distorting generator being so configured as to control said complex gain adjuster to predistort the baseband signal in amplitude and in phase;

an up-converter receiving said predistorted baseband signal; said up-converter being so configured as to supply an up-converted predistorted signal to said signal input of said power amplifier;

a first digital receiver producing a first feedback signal in response to the predistorted baseband signal;

a second digital receiver producing a second feedback signal in response to the up-converted amplified output signal from said amplified signal output;

a control module receiving said first and second feedback signals from said first and second digital receivers; said control module being so configured as to model said power amplifier in response to the first and

second feedback signals and to update said amplitude and phase look-up table of said distorting generator in response to said modeling of said power amplifier.

17. An adaptive device for predistorting a signal to be transmitted, supplied by a signal source to an input of a power amplifier having an output for delivering an amplified output signal, comprising:

predistorter means comprising predistortion amplitude and phase look-up table means interposed between the signal source and the input of the power amplifier for amplitude and phase predistorting the signal to be transmitted;

digital receiver means for producing a first feedback signal in response to the predistorted signal from the predistorter means;

digital receiver means for producing a second feedback signal in response to the amplified output signal from the power amplifier;

means for modeling the power amplifier in response to the first and second feedback signals; and

means for updating the predistortion amplitude and phase look-up table means in response to said modeling of the power amplifier.